Nikon

OPTIPHOT

EPI-BRIGHT/DARK FIELD ILLUMINATOR "BD"

INSTRUCTIONS

MP MASTER
MA29617

NIPPON KOGAKU K.K.

EPI-BRIGHT/DARK FIELD ILLUMINATOR "BD" is used being attached between the eyepiece tube and the stand of Nikon Microscope OPTIPHOT, principally for examining an opaque subjects, such as IC, plastic, tissue, metallurgical, mineralogical specimen with reflecting illumination.
Follow these instructions for correct using, referring to the instruction manual supplied for microscope stand.

CAUTIONS

❶ Avoid sharp knocks!

Handle the microscope gently, taking care to avoid sharp knocks.

❷ Power source voltage

Make sure of the power source voltage, seeing the indication plate on the transformer:

LINE 120V 50/60Hz Lamp 6V – 20W

or

LINE 220/240V 50/60Hz Lamp 6V – 20W

In European district, set the correct voltage, either 220 or 240V, by means of the change-over switch on the bottom of the transformer.

❸ In lighting the lamp

Some parts of the lamp housing may take a high temperature while the lamp is being lighted, so don't touch the lamp housing and don't bring inflammable substances such as gasoline, thinner and alcohol near to the lamp housing.

❹ Exchanging the lamp bulb and fuse

Before replacing the lamp bulb or fuse, turn OFF the power switch and disconnect the plug of the power source cord. In such cases as of replacement, do not touch the lamp bulb with bare hands, immediately after putting out the lamp.

❺ Dirt on the lens

Do not leave dust, dirt or finger marks on the lens surfaces. They will prevent you from clear observation of the specimen image.

CARE AND MAINTENANCE

❶ Cleaning the lenses

To clean the lens surfaces, remove dust using a soft hair brush or gauze. Only for removing finger marks or grease, should soft cotton cloth, lens tissue or gauze lightly moistened with absolute alcohol (ethanol or methanol) be used.
For cleaning the objectives or removing immersion oil, use only xylene.
Observe sufficient caution in handling alcohol and xylene.

❷ Cleaning the painted surfaces

Avoid the use of any organic solvent (for example, thinner, ether, alcohol, xylene etc.) for cleaning the painted surfaces and plastic parts of the instrument.

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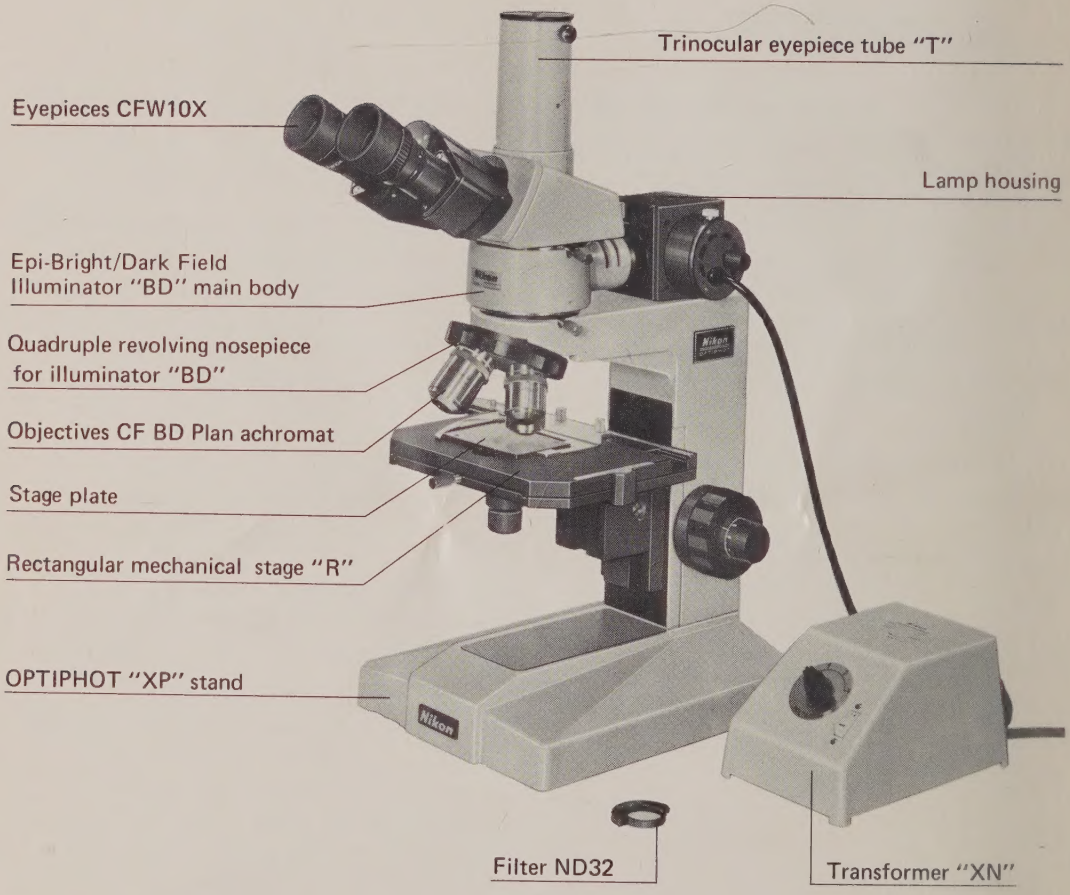
We reserve the right to make such alterations in design as we may consider necessary in the light of experience. For this reason, particulars and illustrations in this handbook may not conform in every detail to models in current production.

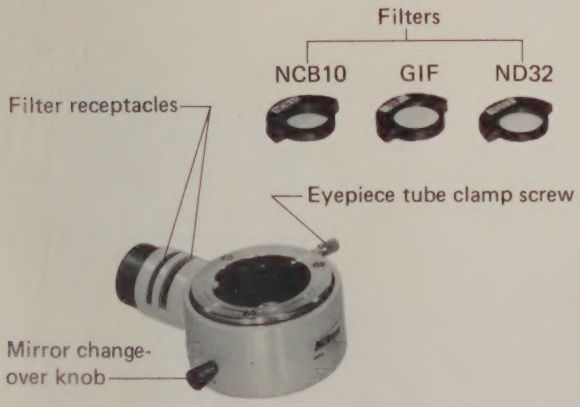
I . NOMENCLATURE



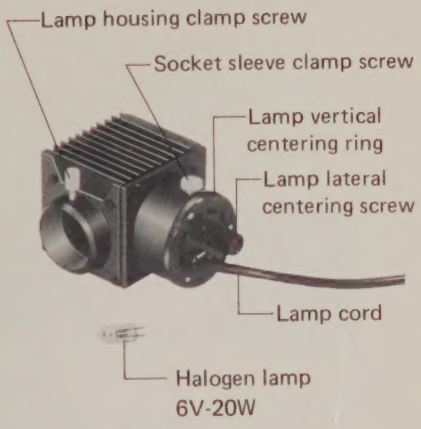
OPTIPHOT MODEL XPT-BD

Other models are available for episcopic bright/darkfield microscopy

Following attachments are used for episcopic bright/darkfield microscopy being attached to the microscope OPTIPHOT main unit.



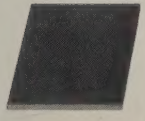
Epi-Bright/Dark Field Illuminator "BD" main body



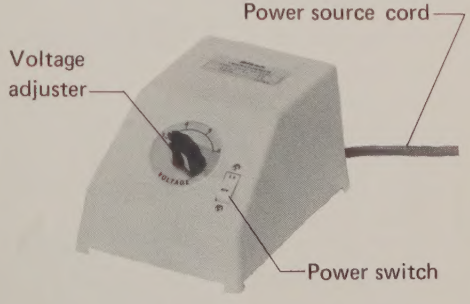
Lamp housing

Objectives CF BD Plan achromat

Quadruple revolving nosepiece for illuminator "BD"



Stage plate

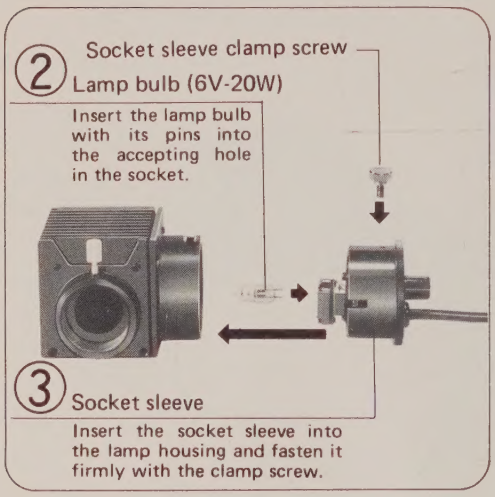


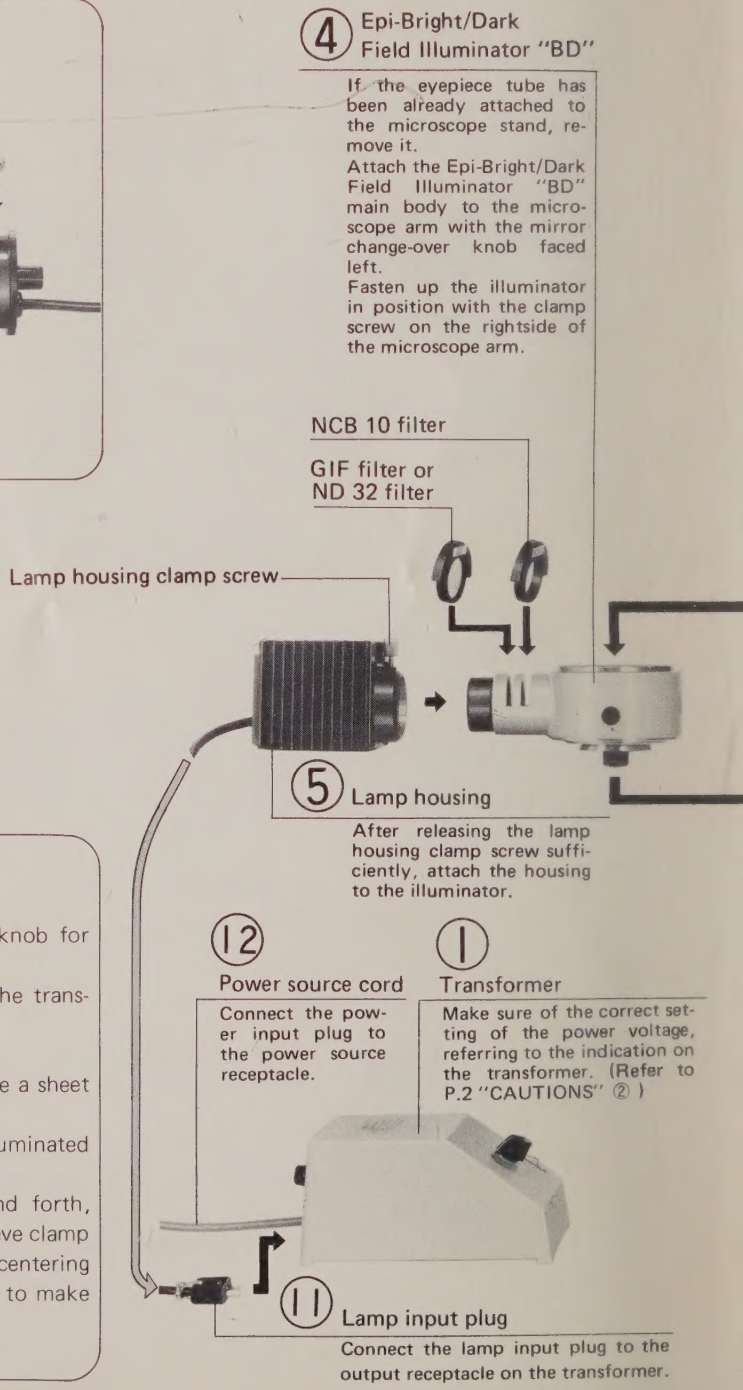
Transformer "XN"

Fig. 1

II. ASSEMBLY

- For assembling the EPI-BRIGHT/DARK FIELD ILLUMINATOR "BD", follow the procedure in the order given below:


② Socket sleeve clamp screw
Lamp bulb (6V-20W)
Insert the lamp bulb with its pins into the accepting hole in the socket.
③ Socket sleeve
Insert the socket sleeve into the lamp housing and fasten it firmly with the clamp screw.


④ Epi-Bright/Dark Field Illuminator "BD"
If the eyepiece tube has been already attached to the microscope stand, remove it.
Attach the Epi-Bright/Dark Field Illuminator "BD" main body to the microscope arm with the mirror change-over knob faced left.
Fasten up the illuminator in position with the clamp screw on the rightside of the microscope arm.
NCB 10 filter
GIF filter or ND 32 filter
Lamp housing clamp screw
⑤ Lamp housing
After releasing the lamp housing clamp screw sufficiently, attach the housing to the illuminator.
⑫ Power source cord
Connect the power input plug to the power source receptacle.
① Transformer
Make sure of the correct setting of the power voltage, referring to the indication on the transformer. (Refer to P.2 "CAUTIONS" ②)
⑪ Lamp input plug
Connect the lamp input plug to the output receptacle on the transformer.

⑬ Centering the lamp

1. Push in the mirror change-over knob for darkfield illumination.
2. Turn ON the power switch on the transformer to light the lamp.
   Set the voltage meter to 6.
3. Swing out the objective and place a sheet of white paper on the stage.
4. On the white paper, a bright, illuminated ring will be imaged.
   Move the lamp housing back and forth, and, after releasing the socket sleeve clamp screw, rotate the lamp lateral centering screw and vertical centering ring, to make the ring image uniformly bright.

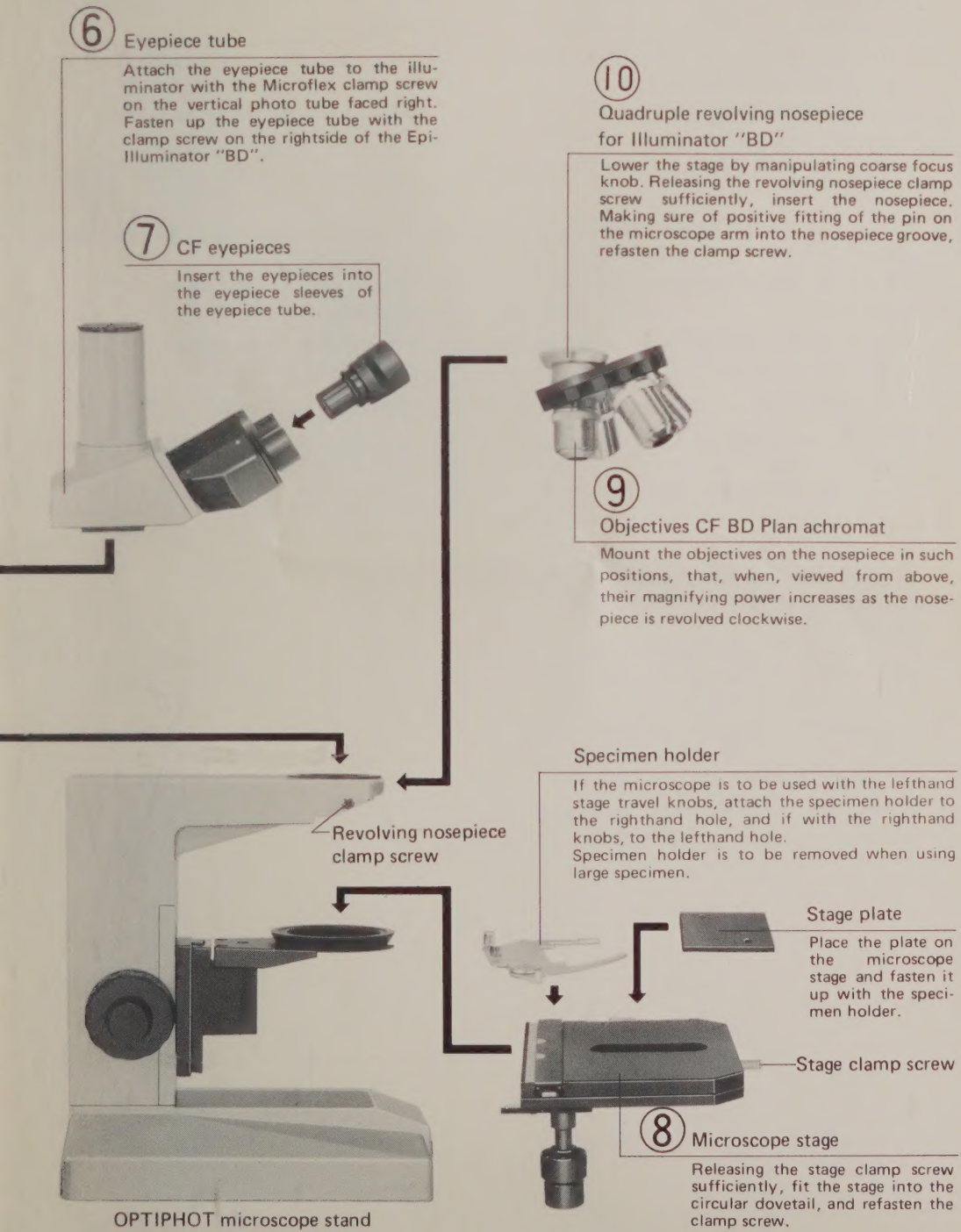

6 Eyepiece tube
Attach the eyepiece tube to the illuminator with the Microflex clamp screw on the vertical photo tube faced right. Fasten up the eyepiece tube with the clamp screw on the rightside of the Epi-Illuminator "BD".
7 CF eyepieces
Insert the eyepieces into the eyepiece sleeves of the eyepiece tube.
10 Quadruple revolving nosepiece for Illuminator "BD"
Lower the stage by manipulating coarse focus knob. Releasing the revolving nosepiece clamp screw sufficiently, insert the nosepiece. Making sure of positive fitting of the pin on the microscope arm into the nosepiece groove, refasten the clamp screw.
9 Objectives CF BD Plan achromat
Mount the objectives on the nosepiece in such positions, that, when, viewed from above, their magnifying power increases as the nosepiece is revolved clockwise.
Revolving nosepiece clamp screw
Specimen holder
If the microscope is to be used with the lefthand stage travel knobs, attach the specimen holder to the righthand hole, and if with the righthand knobs, to the lefthand hole.
Specimen holder is to be removed when using large specimen.
Stage plate
Place the plate on the microscope stage and fasten it up with the specimen holder.
Stage clamp screw
8 Microscope stage
Releasing the stage clamp screw sufficiently, fit the stage into the circular dovetail, and refasten the clamp screw.
OPTIPHOT microscope stand

Fig. 2

III. MICROSCOPY

1. Operating Procedure for Episcopic Darkfield Microscopy

1) Push in the mirror change-over knob to the limit.
2) Turn ON the power switch on the transformer to light the lamp.
   Set the voltage meter to 6.
3) Insert the filters to be used.
   For general microscopy, use the NCB 10 filter.
4) Place the specimen on the stage plate.
   Focus on the specimen using 10× objective.
5) Adjust the interpupillary distance and diopter.
6) Make sure of correct illumination.
7) Swing in the objective to be used and refocus on specimen.
   Though the BD 60× and BD 100× objectives are provided with a safety device, their top end lens surface being somewhat projected from the circumferential metal, be careful not to strike it against the specimen or others.
   Furthermore, the characteristics (directionality, etc.) of the image produced by such objectives may be affected by the degree of centering of the lamp (light source). It is necessary to perform recentering of the lamp, watching the image.
8) Adjust the brightness by changing the lamp voltage.

2. Operating Procedure for Episcopic Brightfield Microscopy

1) Pull out the mirror change-over knob to the limit.
2) Turn ON the power switch on the transformer to light the lamp.
   Set the voltage meter to 4 or 5.
3) Insert the filters to be used.
   For general microscopy, use the NCB 10 filter and ND 32 filter.
4) Place the specimen on the stage plate.
   Focus on the specimen using 10× objective.
5) Adjust the interpupillary distance and diopter.
6) Make sure of correct illumination.
7) Swing in the objective to be used and refocus on specimen.
8) Adjust the brightness by ND filter or by changing the lamp voltage.

3. Manipulation of Each Element

1) Use of filters

The accessory filters are as shown below:

Use of Filters

Indication	Type of filter	Use
NCB 10	Color balancing filter	For general microscopy and color photomicrography
GIF	Green interference filter	For contrast adjustment
ND 32	ND 32 filter (T = 3%)	For dazzle-prevention when changing over the viewfield; bright to/from dark

The ND 32 filter is to be removed out of the optical path, if only the brightfield observation is made or no filter is used on account of the type of the specimen.

2) Changing-over the mirror

To change-over the mirror to the brightfield from the darkfield or to the darkfield from the brightfield position, only manipulate the mirror change-over knob.

IV. SPECIFICATIONS

1. EPI-BRIGHT/DARK FIELD ILLUMINATOR "BD" Main Body

Magnification: 1×

Mirror changing-over:

Changeable to the brightfield from the darkfield or vice versa

Usable filters:

NCB 10 (Color balancing) filter, GIF (Green interference) filter and ND 32 filter

2. Lamp Housing

Light source:

6V-20W Halogen lamp (PHILIPS 7388)

With filament centering device

3. Transformer "XN"

Primary voltage:

120V or 220/240V 50/60Hz

Secondary voltage:

3 - 4 - 5 - 6V (Changed-over with rotary switch)

Fuse: 1A/250V for power source 120V or 0.5A/250V for power source 220/240V

4. Objectives to be Used

CF BD Plan series

5. Quadruple Revolving Nosepiece for Illuminator "BD"

Mount for objective: 4 mounts

6. Stage Plate

Attachable on the stage

ELECTRIC SPECIFICATIONS

Power source (Transformer)	120V / 220/240V 50/60Hz
Secondary voltage of the transformer	3-4-5-6V
Light source	6V-20W Halogen lamp (PHILIPS 7388)
Fuse	1A/250V / 0.5A/250V

Nikon

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